

Simpson Associates		Page 1
Unit B10, Elmbridge Court Business Park Gloucester GL3 1JZ	C21319 West Drayton Attenuation Design	
Date 23/12/2016	Designed by LJ	
File C21319 - ATTENUATION - ...	Checked by RW	
XP Solutions	Source Control 2014.1.1	

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 42 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	26.429	0.529	0.0	13.0	13.0	43.7	O K
30 min Summer	26.521	0.621	0.0	13.5	13.5	51.3	O K
60 min Summer	26.541	0.641	0.0	13.7	13.7	53.0	O K
120 min Summer	26.491	0.591	0.0	13.4	13.4	48.8	O K
180 min Summer	26.423	0.523	0.0	13.0	13.0	43.2	O K
240 min Summer	26.353	0.453	0.0	12.9	12.9	37.5	O K
360 min Summer	26.228	0.328	0.0	12.9	12.9	27.1	O K
480 min Summer	26.132	0.232	0.0	12.9	12.9	19.2	O K
600 min Summer	26.070	0.170	0.0	12.5	12.5	14.0	O K
720 min Summer	26.028	0.128	0.0	11.8	11.8	10.6	O K
960 min Summer	25.980	0.080	0.0	10.3	10.3	6.7	O K
1440 min Summer	25.937	0.037	0.0	8.0	8.0	3.1	O K
2160 min Summer	25.907	0.007	0.0	5.9	5.9	0.5	O K
2880 min Summer	25.900	0.000	0.0	4.7	4.7	0.0	O K
4320 min Summer	25.900	0.000	0.0	3.4	3.4	0.0	O K
5760 min Summer	25.900	0.000	0.0	2.7	2.7	0.0	O K
7200 min Summer	25.900	0.000	0.0	2.2	2.2	0.0	O K
8640 min Summer	25.900	0.000	0.0	1.9	1.9	0.0	O K
10080 min Summer	25.900	0.000	0.0	1.7	1.7	0.0	O K
15 min Winter	26.506	0.606	0.0	13.4	13.4	50.1	O K

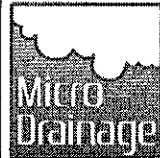
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	128.509	0.0	54.8	17
30 min Summer	84.301	0.0	71.5	30
60 min Summer	52.662	0.0	89.6	46
120 min Summer	31.774	0.0	108.1	82
180 min Summer	23.324	0.0	118.9	116
240 min Summer	18.617	0.0	126.7	148
360 min Summer	13.517	0.0	138.2	210
480 min Summer	10.768	0.0	146.7	268
600 min Summer	9.020	0.0	153.5	326
720 min Summer	7.802	0.0	159.3	382
960 min Summer	6.200	0.0	168.8	500
1440 min Summer	4.478	0.0	182.9	736
2160 min Summer	3.229	0.0	197.9	1100
2880 min Summer	2.558	0.0	209.0	0
4320 min Summer	1.839	0.0	225.5	0
5760 min Summer	1.454	0.0	237.7	0
7200 min Summer	1.211	0.0	247.5	0
8640 min Summer	1.043	0.0	255.7	0
10080 min Summer	0.919	0.0	262.8	0
15 min Winter	128.509	0.0	61.3	17

Simpson Associates		Page 2
Unit B10, Elmbridge Court Business Park Gloucester GL3 1JZ	C21319 West Drayton Attenuation Design	
Date 23/12/2016	Designed by LJ	
File C21319 - ATTENUATION - ...	Checked by RW	
XP Solutions		Source Control 2014.1.1

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	26.620	0.720	0.0	14.2	14.2	59.5	O K
60 min Winter	26.643	0.743	0.0	14.4	14.4	61.4	O K
120 min Winter	26.568	0.668	0.0	13.8	13.8	55.2	O K
180 min Winter	26.463	0.563	0.0	13.2	13.2	46.6	O K
240 min Winter	26.358	0.458	0.0	12.9	12.9	37.9	O K
360 min Winter	26.172	0.272	0.0	12.9	12.9	22.4	O K
480 min Winter	26.060	0.160	0.0	12.4	12.4	13.3	O K
600 min Winter	26.004	0.104	0.0	11.2	11.2	8.6	O K
720 min Winter	25.973	0.073	0.0	10.0	10.0	6.1	O K
960 min Winter	25.940	0.040	0.0	8.1	8.1	3.3	O K
1440 min Winter	25.907	0.007	0.0	6.0	6.0	0.6	O K
2160 min Winter	25.900	0.000	0.0	4.3	4.3	0.0	O K
2880 min Winter	25.900	0.000	0.0	3.4	3.4	0.0	O K
4320 min Winter	25.900	0.000	0.0	2.5	2.5	0.0	O K
5760 min Winter	25.900	0.000	0.0	1.9	1.9	0.0	O K
7200 min Winter	25.900	0.000	0.0	1.6	1.6	0.0	O K
8640 min Winter	25.900	0.000	0.0	1.4	1.4	0.0	O K
10080 min Winter	25.900	0.000	0.0	1.2	1.2	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	84.301	0.0	80.3	30
60 min Winter	52.662	0.0	100.0	50
120 min Winter	31.774	0.0	121.3	88
180 min Winter	23.324	0.0	133.4	124
240 min Winter	18.617	0.0	142.0	160
360 min Winter	13.517	0.0	154.6	220
480 min Winter	10.768	0.0	164.2	272
600 min Winter	9.020	0.0	172.0	326
720 min Winter	7.802	0.0	178.4	384
960 min Winter	6.200	0.0	189.1	500
1440 min Winter	4.478	0.0	204.9	736
2160 min Winter	3.229	0.0	221.7	0
2880 min Winter	2.558	0.0	234.1	0
4320 min Winter	1.839	0.0	252.5	0
5760 min Winter	1.454	0.0	266.2	0
7200 min Winter	1.211	0.0	277.2	0
8640 min Winter	1.043	0.0	286.4	0
10080 min Winter	0.919	0.0	294.3	0

Simpson Associates		Page 3
Unit B10, Elmbridge Court Business Park Gloucester GL3 1JZ	C21319 West Drayton Attenuation Design	
Date 23/12/2016	Designed by LJ	
File C21319 - ATTENUATION - ...	Checked by RW	
XP Solutions	Source Control 2014.1.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.402	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.227

Time (mins)	Area (ha)
From: 0	To: 4 0.227

Simpson Associates		Page 4
Unit B10, Elmbridge Court Business Park Gloucester GL3 1JZ	C21319 West Drayton Attenuation Design	
Date 23/12/2016	Designed by LJ	
File C21319 - ATTENUATION - ...	Checked by RW	
XP Solutions	Source Control 2014.1.1	

Model Details

Storage is Online Cover Level (m) 27.700

Cellular Storage Structure

Invert Level (m) 25.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	87.0	87.0	0.900	0.0	116.9
0.800	87.0	116.9			

Hydro-Brake® Outflow Control

Design Head (m) 0.860 Hydro-Brake® Type Md5 SW Only Invert Level (m) 25.800
Design Flow (l/s) 14.6 Diameter (mm) 160

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.5	1.200	16.9	3.000	26.7	7.000	40.8
0.200	11.1	1.400	18.2	3.500	28.8	7.500	42.2
0.300	12.8	1.600	19.5	4.000	30.8	8.000	43.6
0.400	12.8	1.800	20.7	4.500	32.7	8.500	44.9
0.500	12.7	2.000	21.8	5.000	34.5	9.000	46.2
0.600	12.9	2.200	22.9	5.500	36.1	9.500	47.5
0.800	14.1	2.400	23.9	6.000	37.7		
1.000	15.5	2.600	24.8	6.500	39.3		